REMARKS

The Office Action mailed August 2, 2006 has been received and reviewed. This response is directed toward that action.

Claims 1-14 are pending. Claims 10 and 11 are allowed. Claims 1-9 and 12-14 were rejected. Based on the foregoing amendments and following remarks, Applicant respectfully requests that the Examiner withdraw the rejections, allow the new claims, and allow this application to proceed to issue.

Applicant thanks the Examiner for his helpful comments.

Applicant believes that certain complex processes disclosed by Applicant in the original specifications can be communicated better using short, precisely defined terms. Accordingly, two paragraphs in the specification have been amended to define the meaning of the terms "external thermodynamic exchange", "thermodynamically treated fluids", and "plunger action", the details of which were all fully disclosed in the unamended specification. These terms are introduced solely to identify the respective, previously disclosed complex processes with two- or three-word terms.

The Examiner rejected claims 1-9 and 12-14 under 35 USC 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter Applicant regards as his invention. The Examiner states, "All claims must contain a preamble, transitory phrase and a body. These claims contain no transitional phrase or body."

Applicant respectfully disagrees that all claims must contain a preamble, transitional phrase and a body. There is no set statutory form for claims (MPEP 608.01(m)). The 3-part form in 37 CFR 1.75(e) is suggested particularly for the description of improvement-type inventions (MPEP 608.01(m)). The present invention is not of the improvement-type.

Applicant respectfully disagrees that claims 1-2 and 6-9 are indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention because they are unduly broad and do not set forth any structure to allow one to ascertain the scope of the claims. With regard to independent claims 1 and 6, Applicant regards his invention as a novel thermodynamic recovery system wherein

recovered liquids are heated by the heat of compression of recovered gasses and compressed recovered gasses are thereby cooled by the loss of heat to the recovered liquids. This heat exchange is a natural result of the First Law of Thermodynamics without further "structure" because the recovered gasses and liquids recovered remain physically mixed and the recovered gasses transfer their heat of compression to the recovered liquids, thereby cooling the gasses and heating the liquids thermodynamically. Of course, this heat exchange process may also occur in other ways (for example, by immersing a compressor in the recovered liquids). Thus the portion of independent claim 1 that recites, "An oil and gas recovery system for ... injecting compressed gasses cooled by recovered liquids and liquids heated by the heat of compression of recovered gasses into an oil and gas well...." points out particularly and distinctly the subject matter Applicant regards as his invention and would not be unduly broad even if not limited by "simultaneously" and "for uninterrupted production from said well during well maintenance". Likewise, the portion of independent claim 6 that recites, "A lift gas oil and gas recovery unit ... for ... injecting compressed gasses cooled by recovered liquids and liquids heated by the heat of compression of recovered gasses into an oil and gas well for well maintenance...." points out particularly and distinctly the subject matter Applicant regards as his invention and would not be unduly broad even if not limited by "controlled by wellhead pressure", "simultaneously" and "without interrupting production". Since claims 2 and 7-9 are dependent claims that refer to claims 1 and 6, respectively, Applicant believes that claims 1-2 and 6-9 particularly point out and distinctly claim the subject matter Applicant regards as his invention and are written in a manner commensurate with the scope of the invention.

Applicant believes that claims 1-2 and 6-9 could be stated more clearly, and he thanks the Examiner for bringing this to his attention. In response, Applicant has amended the specification (penultimate paragraph on page 6) to distinguish "internal thermodynamic exchange", which is disclosed earlier in the paragraph in connection with Figure 1, and "external thermodynamic exchange", which is disclosed at the end of the paragraph, also in connection with Figure 1. Applicant has also used the disclosure in the same paragraph to define "thermodynamic treated fluids". Applicant has incorporated these definitions in the claims in order to make crystal clear that Applicant regards his

invention at least in part as a novel use of internal thermodynamic exchange to provide thermodynamically treated fluids, a point which Applicant believes is fully disclosed throughout his specification.

In order to ensure full responsiveness to the Examiner's objections to claims 1-3, Applicant has added claims 15-31. Applicant believes that claims 15-31 describe Applicant's novel thermodynamic recovery systems disclosed in his Application.

Applicant also thanks the Examiner for his comments regarding claims 3-5. Applicant has amended independent claims 3 and 5 so that they too incorporate this novel use of internal thermodynamic exchange to create thermodynamically treated fluids. Claim 4 is dependent on claim 3, which Applicant believes is no longer unduly broad.

In order to ensure full responsiveness to the Examiner's remarks regarding his rejection under Paragraph 2 of 35 USC 112 of claims 1-9, Applicant has added claims 15-31 to further specify his novel thermodynamic systems. Claims 15-25 relate to Applicant's novel thermodynamic recovery system (claims 1-3) and claims 24-31 relate to his novel thermodynamic injection system, both of which use thermodynamically created fluids and internal thermodynamic exchange. Applicant believes that claims 15-31 particularly point out and claim Applicant's novel injection system even more distinctly.

The Examiner also rejected claims 1-2 and 6-9 under 35 USC 102(b) as being anticipated by Stoisits et al. 5,421,408 and claim 1 under 35 USC 102(b) as being anticipated by Prates et al. 3,727,686.

Stoisits does not disclose a recovery system. It discloses a system for re-injecting natural gas into an earth formation by using static mixers to blend water and gas and injecting the mixture into the formation to store it there. Stoisits does not mix the water and gas in the compressor as and if needed as does the present invention. Therefore, Stoisits does not anticipate the relevant portion of claim 1 that recites, "An oil and gas recovery system for ... injecting compressed gasses cooled by recovered liquids and liquids heated by the heat of compression of recovered gasses into an oil and gas well...." Since claim 2 is dependent on claim 1, it also comprises Applicant's novel thermodynamic recovery system wherein recovered liquids are heated by the heat of compression of recovered gasses and compressed recovered gasses are thereby cooled by

the loss of heat to the recovered liquids, wherein this time the injection frequency is controlled wellhead pressure.

Unlike claim 1 herein, the claims in Prates are to a process, not a recovery system. The process is commonly known in the art as creating an "underground fire" and may be useful for recovering viscous hydrocarbons (tars) that cannot be readily recovered by means commonly employed in the art. Thus, Prates injects a hot liquid to heat up the tar and an oxidizing agent (commonly oxygen in air mixed with hot water or steam) into the subterranean reservoir (usually through a neighboring well), ignites the tar, and uses the heat of combustion together with the hot liquid to heat the tar and mobilize it so that it can be recovered (however, usually turning to asphalt if the ambient temperature is insufficient to keep it heated). The present invention actually cools the agent (lift gas) injected into the reservoir liquid to mobilize and recover it, and unlike Prates, the present invention does not involve any oxidation or ignition for heat or any other purpose, but rather uses the heat of compression of hydrocarbons to be injected as lift gasses to heat up recovered and/or maintenance liquids prior to their injection. Moreover, the present invention uses only one well and does not require horizontal flow within the lower portion of the reservoir and uses only one well. In fact, the present invention is not designed for recovery of highly viscous liquids, and would not even work well to recover the viscous tars for which Prates is designed. Since Prates involves a process for injecting an oxidizing gas and a warming fluid into a viscous liquid, it does not anticipate an oil and gas recovery system for injecting compressed gasses cooled by recovered liquids and liquids heated by the heat of compression of recovered gasses into an oil and gas well.

The Examiner also rejected claims 3-5 under 35 USC 102(b) as anticipated by McCarvell et al. 3,147,808. Applicant respectfully disagrees. McCarvell discloses the classic prior art plunger lift system whereas the present invention is a gas lift system. McCarvell does not inject any gas but rather relies on gravity to cause a plunger to sink to the well bottom. This can take a rather long time. Then McCarvell relies on sufficient gas in the reservoir to resist the force of gravity and push the plunger loaded with fluid to the surface. These two steps—gravity plunging and reservoir gas lifting—can take a rather long time compared to the time required for the present invention to compress the lift gas, inject it, and collect the recovered liquid at the surface because the present invention

involves compression in an otherwise closed loop. As discussed in the introduction, the present invention operates at lower costs and improves production substantially over prior art plunger lift by increasing the lift frequency available in a plunger lift system. While the actual improvement in production from a given well varies, it is not unusual for the present invention to lift sixty barrels per day from a well that produced less than one barrel per day using plunger lift. Since McCarvell is a plunger lift system driven by uncompressed reservoir gas, it does not anticipate Applicant's lift gas injection systems.

The Examiner also rejected claims 3-5 under 35 USC 102(b) as anticipated by Dalsmo at al. 6,595,294 which disclose a system using chokes and controllers to optimize gas lift. The present invention does not use chokes or controllers but rather stroke frequency resulting from reservoir characteristics to optimize lift. While the present invention also injects pulses of gas without interrupting production, it does so completely differently than Dalsmo. For example, nothing in Dalsmo disclose or anticipate pulse injection rates influenced by the density of natural gas in the reservoir which, in turn, is determined by its composition and temperature (as well as its pressure) and the plunging action in the reservoir.

In addition to the above, Applicant believes that amended claims 3 and 5 are not anticipated McCarvell or Dalsmo because they now clearly incorporate Applicant's novel use of thermodynamically treated fluids. Neither McCarvell nor Dalsmo disclose or anticipate an injection unit for injecting compressed gasses cooled by recovered liquids and fluids heated by the heat of compression of recovered gasses into an oil and gas well.

In order to ensure full responsiveness to the Examiner's objections to claims 3-5, Applicant has added claims 24-31. Applicant believes that claims 24-31 describe Applicant's novel injection systems disclosed in his Application.

The Examiner correctly points out that method claims must include at least one step, but rejected claims 12-14 under Paragraph 2 of 35 USC 112 because they do not contain any steps. Applicant respectfully disagrees. He believes that claims 12 and 13 each contain one step (injecting lift gas and heated liquids), and claim 14 contains three steps (gas is compressed in a compressor, heat generated is transferred to liquids, and the compressed gas is injected simultaneously).

The Examiner also rejected claims 12-13, Applicant's injection process, under Paragraph 2 of 35 USC 112 because they are unduly broad and do not set forth sufficient structure or steps to allow one to ascertain their scope, and claim 12 under 35 USC 102(b) as anticipated by Prates, which discloses the so-called "underground fire" process (described above) of simultaneously injecting an oxidizing gas and heated liquid into a well containing viscous liquid to mobilize it for recovery.

Applicant has amended the process in independent claim 12 to more clearly include Applicant's novel use of thermodynamically treated fluids therein. Applicant believes that claim 12 describes a process which, due to its novel nature, is a single step, namely injecting thermodynamically treated fluids together rather than in two steps, for lifting and for well maintenance. Applicant has also corrected the typo in dependent claim 13 by amending it so that it now refers to claim 12 rather than claim 11. Applicant believes that amended claims 12 and 13 particularly point out and distinctly claim his novel process using thermodynamically treated fluids for simultaneously injection of maintenance fluids and lift gas.

In order to ensure full responsiveness to the Examiner's objections to claim 12, Applicant has added claims 32-40. Applicant believes that claim 32 sets forth six concrete steps that also particularly point out and distinctly claim a novel process for oil and gas injection.

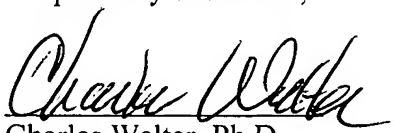
The processes described in claims 12-13 and 32-40 all differs substantially from Prates in that Applicant's invention uses a compressor capable of pumping liquids and gasses simultaneously whereas Prates uses an oxidizing gas and heated liquid to mobilize a viscous liquid. Since the process in Prates uses a heated agent and combustion to mobilize and recover tar hydrocarbons, Prates does not anticipate the use of a compressor that compresses and pumps liquids mixed with gasses, and injects a cooled, noncombustable agent to mobilize less viscous reservoir fluids.

Finally, the Examiner rejected claim 14, Applicant's combined process, under Paragraph 2 of 35 USC 112, because it does not include any steps, is unduly broad, and does not set forth sufficient structure or steps to allow one to ascertain its scope. Applicant respectfully disagrees. Claim 14 comprises three well-identified steps. The first step is to use the pressure of natural gas from a well to control the stroke frequency of a

compressor. The second step is the transfer of heat of compression from the compressor to liquids to be injected in the well, thereby cooling the gasses compressed as required by the First Law of Thermodynamics. The third (simultaneous) step is the injection of the cooled compressed gasses with or without the heated liquids. Applicant believes that combining the second step with the first and third steps is especially novel, the structure of each step is clear, and the breadth of the steps is justified by the disclosed invention. Applicant has amended claim 14 by re-structured and clarifying these three steps.

Based on the foregoing amendments and remarks, Applicant submits that the present claims are not indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as his invention, nor are they anticipated by the cited references. Accordingly Applicant respectfully requests that the Examiner withdraw the rejections, allow the new claims, and allow this case to proceed to issue. If any issues remain, the resolution of which may be resolved through a telephone conference, the Examiner is invited to contact Applicant's attorney at the number listed below.

Respectfully submitted,



Charles Walter, Ph.D.
PTO Reg. No. 29874
(713) 667-5107
9131 Timberside Drive
Houston, TX 77025